

ABSTRACT

A method for characterizing fluorescent molecules or other particles in samples comprising the steps of:

- a) monitoring fluctuating intensity of fluorescence emitted by the molecules or other particles in at least one measurement volume of a non-uniform spatial brightness profile by measuring numbers of photon counts in primary time intervals by a single or more photon detectors,
- b) determining at least one distribution of numbers of photon counts, $\hat{P}(\mathbf{n})$, from the measured numbers of photon counts,
- c) determining physical quantities characteristic to said particles by fitting the distribution of numbers of photon counts $\hat{P}(\mathbf{n})$,

wherein the fitting procedure involves calculation of a theoretical distribution function of the number of photon counts $P(\mathbf{n})$ through its generating function, defined as

$$G(\vec{\xi}) = \sum_{\mathbf{n}} \vec{\xi}^{\mathbf{n}} P(\mathbf{n}).$$